UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/660,016	06/06/96	PIPPIN	042390.P1674

B3M1/1003

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BLVD SEVENTH FLOOR
LOS ANGELES CA 90025

EXAMINER	
SIEK, V	
ART UNIT	PAPER NUMBER
2304	17

DATE MAILED: 10/03/97

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/660,016	Applicant(s) Jack D. Pippin
	Examiner Vuthe Siek	Group Art Unit 2304

☒ Responsive to communication(s) filed on *Jan 14, 1997* .

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-19 and 37-39* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-19 and (37-39 interference)* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on *Jul 14, 1997* is ☒approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *13*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

RESPONSE TO AMENDMENT

1. This office action responds to the applicant's remark filed on 07-14-97. Claims 1-19 and 37-39 remain for examination. Claims 1-19 are amended.

2. The examiner has approved the drawing changes (paper # 15).

3. Applicant's response regarding objection to the specification has been fully considered and objection of the specification has been withdrawn.

4. Applicant's response regarding objection to the claimed numbering has been fully considered and objection of the claimed numbering has been withdrawn.

5. Applicant's arguments filed 07-14-97 have been fully considered but they are not deemed to be persuasive.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-3, 8-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giordano et al. (hereafter Giordano) U.S. Patent 5,359,236 in view of Kenny et al. U.S. Patent 5,287,292 and further view of Joehlin et al. (Hereafter Joehlin), U.S. Patent 4,807,144.

8. As to claims 1-3, 8-10 and 15, Giordano discloses an integrated circuit thermal sensor. As shown in Fig. 4, the well known integrated thermal sensor included precise CMOS bandgap voltage references which use the difference of MOS source-gate voltage to perform efficient curvature compensation have been designed and fabricated. Fig. 1A shows a portion of a bandgap voltage KVbg being applied between the base and emitter of bipolar transistor Q1, also referred to as the controlled device. Generally, the bandgap voltage, KVbg, applied to the base of Q1 is held at a relatively fixed value as a function of temperature, as shown in Fig. 1B. Temperature sensing is achieved by relying on the well known principle that the base-to-emitter voltage (Vbe) of a bipolar transistor decreases at a predetermined rate (col 1, lines 26-38). Accordingly, Giordano discloses circuits embodying the invention include a means for generating a turn-on signal which increases with increasing temperature. This turn-on signal is applied to the control device whose turn-on threshold decreases with temperature. Giordano also discloses that the integrated thermal sensor includes a current source to generate the turn-on (or control) voltage (signal) which is increased

linearly as a function of increasing temperature (col 3, lines 2-5, col 5 and Figs. 2 & 4). Thus, this control voltage V14 is scaling to proportionally and linearly with increasing temperature. It should be noted be noted scaling voltage concept is well known in the art, and the scaling voltage can be provided by using voltage dividers as claimed. This voltage dividers can constructed according the desired voltage and with addition of transistors used to connect therewith in order to provide different state logic outputs, thus providing binary outputs with binary inputs applying to input voltage dividers. Accordingly, scaling voltage could be generated. It is also noted that in the design of an analog integrated circuit, it is necessary to establish a voltage or current reference which is substantially independent of variations in temperature. Regarding to varying threshold voltage detection, Kenny discloses an integrated circuit to detect programmable threshold in order to sense the temperature of a CMOS integrated circuit. When the programmable threshold value is detected (predetermined temperatures), the CPU speed is decreased or increased accordingly (see summary). In addition, Joehlin teaches a method for detecting a threshold temperature including the step of receiving a threshold temperature including the step of receiving at least one programmable input specifying a value corresponding to a threshold temperature (see abstract, summary, col 5, lines 13-24). Therefore, with the motivation of detecting a programmable threshold according to programmable input signals as taught by Joehlin, one of ordinary skill in the art at the time the invention was made would have

found it obvious to combine the teachings of Giordano, Kenny, and Joehlin to provide a programmable thermal sensor circuit because this programmable thermal sensor would detect a variety of threshold temperatures in an integrated circuit upon receiving programmable inputs specifying a value corresponding to a threshold temperature the integrated circuit as taught by Joehlin (see abstract, summary, col 5, lines 13-24), thereby it would saves the cost of a cooling fan or heat sink since it is virtually free when implementing on an existing circuit as suggested by Kenny (col 5, lines 11-13) and then improve the thermal sensor performance.

9. Claims 4-7, 11-14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giordano et al. (hereafter Giordano) U.S. Patent 5,359,236 in view of Kenny et al. (Hereafter Kenny), U.S. Patent 5,287,292 and Joehlin et al. (Hereafter Joehlin), U.S. Patent 4,807,144 and in further view of Heck et al. (hereafter Heck) U.S. Patent 5,077,491.

10. As to claims 4-7, 11-14 and 16-19, Giordano, Kenny and Joehlin teach all limitations of the claimed invention but not explicitly step of scaling sensing voltage and comparison means. Giordano suggest scaling sensing voltage using resistive elements R1 and R2 (col 5 of Giordano). It is noted that the CMOS bandgap voltage reference is well known in the art at the time the invention was made and Giordano use

the circuit for producing a voltage reference. It should be noted scaling voltage concept is well known in the art, and the scaling voltage can be provided by using voltage dividers as claimed (Allen et al. CMOS Analog Circuit Design, 1987, by Saunders College Publishing, a division of Holt, Rinehart and Winston). This voltage dividers can constructed according the desired voltage and with addition of transistors used to connect therewith in order to provide different state logic outputs, thus providing binary outputs with binary inputs applying to input voltage dividers. Accordingly, scaling voltage could be generated Therefore, it would have been obvious matter of design choice to use MOSFET transistors coupled with resistive elements to provide a voltage scaling. Regarding to comparison means, Heck discloses a comparator circuit having a zero temperature coefficient with hysteresis. In general, a well known comparator circuit compares an input signal against a predetermined threshold value and switches between output states depending on whether the input signal is above or below the trip threshold (also see summary). The teachings of Heck would motivate one of ordinary skill in the art at the time the invention was to incorporate a comparison means into the integrated thermal sensor of Giordano in order to generate a control signal or output signal because this would improve the performance of integrated thermal sensor.

11. Regarding to claims 37-39, the examiner understand that the Applicant tries to set up for the interference. Thus, the examiner respectfully submit that the interference's claims will be deferred to a later date.

REMARKS

Responding to the applicant's remark that Giordano, Kenny do not teach a method for detecting a threshold temperature in an integrated circuit including the step of receiving at least one programmable input specifying a value corresponding to a threshold temperature for the integrated circuit, the examiner respectfully disagrees. Giordano teaches a thermal sensor used for detecting a threshold temperature when reference voltage equals to the sensing voltage (Vbe). Giordano provides an example if the Vbe equals to Vref, thus the thermal sensor would detect a threshold temperature for example 75 degrees (col 1, lines 26-67) when Vbe equals to Vref. Accordingly, practitioners in the art would have motivated to program the thermal sensor by providing different input signal in order to providing different sensing voltage output corresponding to different threshold temperature because this would have more advantage because the thermal sensor can detect different threshold temperature. Kenny also clearly shows these features (see paragraph 5). Regarding to the feature of

detecting the threshold temperature and programmable inputs, Kenny clearly teaches these features (see paragraph 5). In addition, Joehlin clearly teaches detecting a threshold temperature in glass sheet furnace including the step of receiving at least one programmable input specifying a value corresponding to a threshold temperature (see abstract, summary, col 5, lines 13-24). Thus, practitioners in the art at the time the invention was made would have motivated to use the concept of detecting a threshold temperature including the step of receiving at least one programmable input specifying a value corresponding to a threshold temperature as taught by Joehlin (see abstract, summary, col 5, lines 13-24) because this would have more advantages because the thermal sensor could detect a various programmable threshold temperature according to a programmable input signal as taught by Joehlin and thereby it would saves the cost of a cooling fan or heat sink since it is virtually free when implementing on an existing circuit as suggested by Kenny (col 5, lines 11-13) and then improve the thermal sensor performance.

Regarding to voltage scaling, Giodano teaches the feature of scaling voltage (see col 3, lines 2-5, col 5 and Figs. 2 and 4). It should be noted be noted scaling voltage concept is well known in the art, and the scaling voltage can be provided by using voltage dividers as claimed (Allen et al. CMOS Analog Circuit Design, 1987, by Saunders College Publishing, a division of Holt, Rinehart and Winston). This voltage dividers can constructed according the desired voltage and with addition of transistors

used to connect therewith in order to provide different state logic outputs, thus providing binary outputs with binary inputs applying to input voltage dividers. Accordingly, scaling voltage could be generated. In addition, since Joehlin teaches detecting a threshold temperature including the step of receiving a threshold temperature including the step of receiving at least one programmable input specifying a value corresponding to a threshold temperature (see abstract, summary, col 5, lines 13-24). Accordingly, the thermal sensor would be scaled in order to provide different voltage output corresponding to different threshold temperature. It is also noted that in the design of an analog integrated circuit, it is necessary to establish a voltage or current reference which is substantially independent of variations in temperature. Regarding to varying threshold voltage detection, Kenny discloses an integrated circuit to detect programmable threshold in order to sense the temperature of a CMOS integrated circuit. When the programmable threshold value is detected (predetermined temperatures), the CPU speed is decreased or increased accordingly (see summary). In addition, Joehlin teaches a method for detecting a threshold temperature including the step of receiving a threshold temperature including the step of receiving at least one programmable input specifying a value corresponding to a threshold temperature (see abstract, summary, col 5, lines 13-24).

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Additional References

13. The following references are cited by the examiner as of general interest.

a. Ristic at al., U.S. Patent 5,291,607 is cited to show a microprocessor having an integrated sensor (summary).

b. Salem, U.S. Patent 4,488,824 is cited to show a bandgap voltage reference and temperature sensor (summary).

c. Chin et al. "A New Type of Curvature-Compensated CMOS Bandgap Voltage References," IEEE, 1991, pp. 398-402.

d. Ferro et al. "A Floating CMOS Bandgap Voltage Reference for Differential Applications," IEEE, 1989, pp. 690-697.

e. Salminen et al. "The Higher Order Temperature Compensation of Bandgap Voltage References," IEEE, 1992, PP. 1388-1391.

Contact Information

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Vuthe Siek** whose telephone number is (703) 305-4958.

Any inquiry of general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 305-3900.

VS

Art Unit 2304

September 25, 1997

KEVIN J. TESKA
SUPERVISORY PATENT EXAMINER
GROUP 2300